

- f) Submit data/information relative to the "diffuse reflectance" method, including an assessment and comparison with the "Diffey methods".

Comment

We are currently not aware of any thorough assessment of diffuse reflectance technology for assessing sunscreen UV efficacy. Scattered reports in the literature, including book chapters and meeting abstracts, and peer-reviewed publications have used diffuse reflectance to measure the transmission spectra and calculate protection factors of a small number of sunscreen products or UV filters¹⁸. However, there are no reports of systematic, rigorous investigation of this method as a means for routine evaluation of sunscreen products.

Based on a limited evaluation by our laboratories, we have concerns about the quantitative ability of the method to assess the UV efficacy of pigmented systems that achieve their performance via scattering. As well, measures at short wavelengths of UV, i.e., 290-320 nm, are difficult which complicates and limits the comparison and connection to *in vivo* SPF measures. Regardless, we believe that much basic work needs to be done before this technique could be implemented as a routine measure of UVA performance.

¹⁸ Kollias, N, Gillies, R, Anderson, RR (1992) The non-invasive determination of UVA sunscreen effectiveness in vivo. In Biological Responses to UVA Radiation, Urbach, F. (ed.), Valdenmar Publishing, Overland Park KS, pp 371-76. Stanfield, JW, Edmonds, SH (1995) Comparison of sunscreen UVA protection factor obtained by non-invasive diffuse reflectance measurements and PFA determinations. *Photochem. Photobiol.* 61(SUPPL):16S. Marginean, G, Fructus, AE, Marty, JP, Arnaud-Battandier, J (1995) New ex-vivo method for evaluating the photoprotective efficacy of sunscreens. *Intl J Cosmet Sci* 17:233-43. Gillies, R, Kollias, N (1997) Noninvasive in vivo determination of sunscreen ultraviolet A protection factors using diffuse reflectance spectroscopy. In Sunscreens. Development, evaluation, and regulatory aspects. Lowe, NJ, Shaath, NA and Pathak, MA (eds.), pp 601-610, Marcel Dekker. Gillies, R, Kollias, N (1998) Evaluation of sunscreen-induced UVA photoprotection measured noninvasively in vivo on human skin. *J Dermatol. Sci* 16 (SUPPL):S225. Pinnell, SR, Fairhurst, D, Gillies, R, Mitchnick, MA, Kollias N (2000) Microfine zinc oxide is a superior sunscreen ingredient to microfine titanium dioxide. *Dermatol Surg* 26:309-14.